

Atlantic Herring Fishery Management Plan

Framework Adjustment 9

Including an Environmental Assessment and
Initial Regulatory Flexibility Analysis

DRAFT

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Prepared by the
New England Fishery Management Council
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Mid-Atlantic Fishery Management Council



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Cover image



**FRAMEWORK ADJUSTMENT 9 TO THE
ATLANTIC HERRING FISHERY MANAGEMENT PLAN**

Proposed Action: Propose a rebuilding plan for Atlantic herring to address overfished status and potentially adjust herring accountability measures to provide more flexibility for the herring fishery and optimize yield.

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Abstract: The New England Fishery Management Council, in consultation with NOAA’s National Marine Fisheries Service, has prepared Framework Adjustment 9 to the Atlantic herring Fishery Management Plan, which includes a draft environmental assessment that presents the range of alternatives to achieve the goals and objectives of the action. The proposed action focuses on implementing a rebuilding plan for Atlantic herring and potentially adjust accountability measures to promote flexibility and optimize yield in the herring fishery. The document describes the affected environment and valued ecosystem components and analyzes the impacts of the alternatives on both. It addresses the requirements of the Magnuson Stevens Fishery Conservation and Management Act, the National Environmental Policy Act, the Regulatory Flexibility Act, and other applicable laws.

1.0 EXECUTIVE SUMMARY

Proposed Action

Impacts of the Proposed Action

Alternatives to the Proposed Action

[Insert table(s) summarizing impacts by VEC]

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No table of figures entries found.

2.3 MAPS

[insert table of maps]

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[insert later]

3.0 BACKGROUND AND PURPOSE

3.1 BACKGROUND

3.1.1 Background on rebuilding plan

If NOAA Fisheries determines that a stock is overfished, a Council must develop a plan to rebuild it to the level that can support maximum sustainable yield (MSY). A rebuilding plan usually allows fishing to continue, but typically at a reduced level so the stock will increase to a target level to support MSY.

NOAA's Assistant Administrator for Fisheries formally determined on October 2, 2020 that the Atlantic herring stock is overfished based on the best scientific information available. The Council was informed of this change in stock status on October 13, 2020. NOAA Fisheries recommends that the Council submit a rebuilding plan within 15 months to ensure sufficient time to implement the appropriate regulations within two years of the notification letter. In this case, fifteen months from October 13, 2020 is January 13, 2022.

The correspondence from NOAA Fisheries explains that the Northeast Fisheries Science Center completed the most recent assessment of the Atlantic herring stock in June 2020 using data through 2019. The assessment supports a determination that the stock is not subject to overfishing, because the 2019 fishing mortality rate ($F = 0.25$) is less than the maximum fishing mortality threshold ($F = 0.54$) but is now overfished because spawning stock biomass in 2019 (77,883 mt) is less than minimum stock size threshold (134,500 mt; NEFSC, (2020)). This is a change from the previous assessment in 2018 that the stock was approaching an overfished condition but also concluded that overfishing was not occurring.

The development of rebuilding plans is guided by §304(c) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), NMFS guidance on MSA implementation (specifically National Standard 1 Guidelines, and judicial review from relevant court cases). There are several key terms and definitions specific to rebuilding plans that the Council will need to specify in a rebuilding plan. The Herring PDT has drafted herring-specific definitions for these required terms, See Table 1. The National Standard 1 Guidelines include more details about how Councils should develop plans to comply with these requirements (<https://www.federalregister.gov/documents/2016/10/18/2016-24500/magnuson-stevens-act-provisions-national-standard-guidelines>).

The Magnuson Act states that the rebuilding time should be as short as possible and “shall not exceed ten years, except in cases where the biology of the stock” or some other considerations “dictate otherwise.” The Secretary is required to review rebuilding plans at routine intervals that may not exceed two years to determine whether the plan is making adequate progress toward ending overfishing. If a stock has not rebuilt by T_{max} , then the fishing mortality rate should be maintained at its current $F_{rebuild}$ or 75% of the MFMT (minimum fishing mortality threshold), whichever is less (see Table 1 for definitions for these terms). While a plan is being developed or revised, a Council can request NOAA Fisheries implement interim measures to reduce overfishing if certain criteria are met.

The Scientific and Statistical Committee (SSC) reviewed initial development and analyses of this rebuilding plan and provided input included as Appendix 1. In general, the SSC felt that all the techniques being used in the rebuilding analyses were both technically sound and appropriate, though some were more realistic than others, and some had more or less risk.

3.1.2 Background on herring accountability measures (AMs)

The Magnuson-Stevens Fishery Conservation and Management Act's National Standard 1 guidelines explain that AMs are management controls to prevent annual catch limits (ACLs), including sector-ACLs, from being exceeded and to correct or mitigate overages of the ACL if they occur. The guidelines also recommend that AMs should address and minimize both the frequency and magnitude of overages and correct the problems that caused the overage in as short a time as possible.

Section ??? summarizes trends in herring fishing effort by herring management area including a summary of overages and underages by year and area. Overall, the AMs in place (both proactive (in-season) and reactive) have helped prevent the total ACL from being exceeded in this fishery. There have been some instances over the years when sub-ACLs have been exceeded, but that is relatively rare and is less common in recent years. However, ACLs have been dramatically reduced in the herring fishery since 2018 and the likelihood of exceeding sub-ACLs may be higher for this high-volume fishery working under relatively low sub-ACLs.

3.2 PURPOSE AND NEED

[To be developed as the Council develops this action.]

3.2.1 Goals and objectives

There are two goals of this action: 1) to develop a rebuilding plan to address the overfished status of Atlantic herring; and 2) potentially adjust herring accountability measures to promote flexibility and optimize yield in the herring fishery.

4.0 ALTERNATIVES UNDER CONSIDERATION

4.1 ACTION 1 – REBUILDING PLAN

This action is considering three alternatives related to how catch limits should be set under a rebuilding plan for Atlantic herring: Alternative 1 (No Action) or no rebuilding plan, Alternative 2 that would set fishing mortality targets using the ABC control rule approved in Amendment 8 to the Herring FMP, and Alternative 3 that would use a constant fishing mortality target estimated to rebuild the herring resource in seven years. In addition to these three rebuilding strategies, the risks associated with these rebuilding plan alternatives were evaluated. Sensitivity analyses of the projection assumptions have been prepared by the Herring PDT and are summarized in Section ???. The Scientific and Statistical Committee reviewed some of these analyses and their feedback is summarized in Appendix I.

4.1.1 Rebuilding Plan Alternative 1 – No Action

Under this alternative, the Council would not recommend implementing a rebuilding plan for Atlantic herring. The Council would continue to set fishery specifications two fishing years at a time with default measures identified for a third year. The Council would likely use the ABC control rule approved in Amendment 8 to set OFL/ABC and other relevant fishery specifications. The rebuilding plan terms defined in Section 4.1.4 would not be incorporated in the Herring FMP if this alternative is selected.

Note: This alternative is not consistent with requirements of the Magnuson-Stevens Act (MSA) to develop and implement a rebuilding plan when a stock is declared overfished.

4.1.2 Rebuilding Plan Alternative 2 – Rebuilding plan that sets fishing mortality target based on Amendment 8 acceptable biological catch (ABC) control rule

Under this alternative, a rebuilding plan would be established. The fishing mortality target for the rebuilding plan would be consistent with the ABC control rule approved in Amendment 8. The control rule is biomass-based, when biomass is high enough such that the ratio of SSB/SSB_{MSY} is more than 0.5, the maximum fishing mortality allowed is 80% of F_{MSY} , so 20% of F_{MSY} is left for herring predators. Under this policy as biomass declines, fishing mortality declines linearly, and if biomass falls below 0.1 for the ratio of SSB/SSB_{MSY} , then ABC is set to zero, no fishery allocation.

The terminal year of the last assessment was FY2019. These rebuilding projections include a two-year bridge, which assume the ABCs already implemented for FY2020 and FY2021 remain in place and are fully harvested. Therefore, Year 1 for this rebuilding plan is FY2022. The projections calculate recruitment using the same methods used in the last assessment; recruitment in each year of the projections was drawn from the empirical cumulative distribution of the estimated recruitments from 1965-2017. The estimates of recruitment from 2018-2019 were excluded because they were imprecisely estimated with CVs equal to 58% and 210%, respectively.

Projections for Alternative 2 suggest that Atlantic herring can rebuild in 5 years, or FY 2026, the year the probability of rebuilding ($P_{rebuild}$) is estimated to be 50% or more. Because this is a biomass-based control rule that adjusts fishing mortality based on projected biomass, the target fishing mortality allowed under this rebuilding plan ($F_{rebuild}$) varies by year, ranging from $F=0.09$ in FY2022 to $F=0.43$ in FY2026. A fishing mortality rate of 0.43 is the maximum fishing mortality rate currently allowed under the Amendment 8 ABC control rule since 0.43 is 80% of the current estimate of F_{msy} (0.54). Even if biomass continues to increase, the maximum fishing mortality rate allowed would remain at $F=0.43$ under this

strategy. These projections estimate $P_{\text{overfished}}$ at 2%; the probability the stock would be overfished in FY2026 is estimated to be 2%. See Section ?? for more details about the projections. The PDT has prepared several additional sensitivity projections to further assess risk and uncertainty.

Rationale: The Council selected this control rule in Amendment 8 because it met specific criteria important to the Council including: low variability in yield, low probability of overfished, low probability of closing the herring fishery, and catch at relatively high proportion of MSY. In summary, the control rule was selected because it explicitly accounts for the role of herring as forage in the ecosystem by limiting fishing mortality at 80% of F_{MSY} and accounts for uncertainty by limiting the maximum allowable fishing mortality rate at 80%. This is expected to help stabilize the fishery in the long term. Overall, the selected control rule balances the goals and objectives of the Atlantic Herring FMP and Amendment 8 and is considered a good compromise; it recognizes the important role of herring in the ecosystem, as forage for predators, as well as an important source of revenue for fishing communities in the Northeast including the directed herring fishery, the lobster fishery that uses herring as bait, as well as many other commercial and recreational businesses that focus on predators of herring. In this action, this rebuilding plan alternative favors the benefits of rebuilding Atlantic herring more quickly over the short-term economic costs lower ABCs will have on the herring fishery while Atlantic herring rebuilds.

When the Council considered implementing an ABC control rule through Amendment 8, it discussed what should happen in terms of applying the ABC control rule if the fishery is declared overfished.¹ The Amendment explained that if the linear decline in F between the upper and lower biomass parameters is enough to meet rebuilding requirements, then the control rule should be adhered to and the fishing mortality produced by the linear decline should be used to specify ABC.

4.1.3 Rebuilding Plan Alternative 3 – Rebuilding plan that sets fishing mortality target based on constant fishing mortality rate estimated to rebuild resource in seven years

Under this alternative, a rebuilding plan would be established. The fishing mortality target of the rebuilding plan would be constant, F_{rebuild} would be set at $F=0.48$, about 89% of F_{MSY} . This value was determined from the projections based on identifying the fishing mortality rate needed to get a Prebuild of 50% in year 7 (FY2028).

The terminal year of the last assessment was FY2019. These rebuilding projections include a two-year bridge, which assume the ABCs already implemented for FY2020 and FY2021 remain and are fully harvested. Therefore, Year 1 for this rebuilding plan is FY2022. The projections calculate recruitment using the same methods used in the last assessment; recruitment in each year of the projections was drawn from the empirical cumulative distribution of the estimated recruitments from 1965-2017. The estimates of recruitment from 2018-2019 were excluded because they were imprecisely estimated with CVs equal to 58% and 210%, respectively.

Projections for Alternative 3 estimate that Atlantic herring can rebuild in 7 years if a constant fishing mortality rate of 0.48 is applied using the same assumptions as the projection model from the last

¹ Language was included in Amendment 8 as guidance if a rebuilding plan became required. Section 2.1.3 of Amendment 8 explains that when a fishery is declared overfished the Council must develop a rebuilding plan and, “specify a time period for rebuilding...that shall be as short as possible...and not exceed ten years.” Amendment 8 states that if the fishery enters a rebuilding plan, the linear decline in F between the upper and lower biomass parameters of the ABC control rule may be insufficient to meet rebuilding requirements. In such cases, deviations from the linear decline in F will be required, and projections will have to be completed to determine the ABC that will achieve rebuilding (equivalent to what is now done to specify ABC in rebuilding plans). The Amendment went on further to state that if the linear decline in F between the upper and lower biomass parameters is enough to meet rebuilding requirements, then the control rule should be adhered to and the F produced by the linear decline should be used to specify ABC.

assessment. Under these conditions, the probability of rebuilding is about 50% in 2028. These projections estimate $P_{\text{overfished}}$ at 2% as well, but in this case that is in FY2028, not FY2026 as in Alternative 2. See Section ?? for more details about the projections. The PDT has prepared several additional sensitivity projections to further assess risk and uncertainty.

Rationale: The Council included Alternative 3 to consider a rebuilding strategy that better accounts for the needs of herring fishing communities. A longer rebuilding timeframe allows fishing mortality targets to be higher to provide higher ABCs. The Atlantic herring resource is estimated to rebuild in less than ten years, but not as quickly as Alternative 2, using the Amendment 8 ABC control rule. This alternative prioritizes the short-term economic benefits to the herring fishery over benefits of rebuilding Atlantic herring more quickly, noting that herring is still expected to rebuild within ten years and relatively small increases in annual catch limits will not greatly reduce the rebuilding schedule (two years in this case).

4.1.4 Summary of required terms related to rebuilding plan

This is not an alternative in this action; this section summarizes the proposed definitions for required terms associated with development of a rebuilding plan regardless of the fishing mortality target selected above. Table 1 summarizes the definitions for these required terms as well as the proposed specifics relative to this rebuilding plan for Atlantic herring in the right-hand column. Many of these terms stem directly from the last assessment for Atlantic herring (2020). If Alternative 2 or 3 is adopted in this action, the terms described in Table 1 will be incorporated into the rebuilding plan for Atlantic herring.

Table 1 – Draft definitions for an Atlantic herring rebuilding plan (not final)

Term	Rebuilding Plan Definitions	Draft Atlantic herring rebuilding plan definitions
MSY	The largest long-term average catch or yield that can be taken from a stock under prevailing ecological, environmental conditions and fishery technological characteristics, and the distribution of catch among fleets.	MSY _{proxy} = 99,400 mt
B _{msy}	The long-term average size of the stock measured in terms of spawning biomass or other appropriate measures of the stock's reproductive potential that would be achieved by fishing at F _{msy} .	SSB _{msy proxy} = 269,000 mt
F _{msy}	The fishing mortality rate that, if applied over the long term, would result in MSY.	F _{msy proxy} = 0.54
Overfished	A stock or stock complex is overfished when its biomass has declined below MSST.	In 2019, SSB estimated at 77,883 mt, < MSST; therefore, the stock is overfished.
MSST	Minimum stock size threshold – level of biomass which the capacity of the stock to produce MSY on a continuing basis has been jeopardized. This level is not precisely specified in the regulations or guidelines, but in practice, generally set at ½ B _{msy} .	½ SSB _{msy proxy} = 134,500 mt
Overfishing	Occurs whenever a stock is subjected to a level of fishing mortality or total catch that jeopardizes the capacity of a stock to produce MSY on a continuing basis.	In 2019, F estimated at 0.25, < MFMT; therefore, overfishing is not occurring
MFMT	Minimum fishing mortality threshold - level of fishing mortality on an annual basis, above which overfishing is occurring.	F=0.54
T _{min}	The amount of time the stock or stock complex is expected to take to rebuild to its MSY biomass level in the absence of any fishing mortality. The term “expected” means to have at least a 50% probability of attaining B _{msy} .	Using F=0, P _{rebuild} reaches over 50% in 4 years under the assumptions used in the last assessment.
T _{max}	The maximum time for rebuilding a stock or stock complex to its B _{msy} . <i>If T_{min} for the stock is 10 years or less, then T_{max} is 10 years.</i> <i>If T_{min} for the stock exceeds 10 years, then several other methods can be used to determine T_{max}.</i>	For Atlantic herring T _{max} is 10 years since T _{min} is 10 years or less.
T _{target}	The target time for rebuilding shall be as short as possible, taking into account: the status and biology of any overfished stock, the needs of fishing communities, recommendations by international organizations in which the U.S. participated, and interactions of the stock within the marine ecosystem. The time period shall not exceed 10 years, except where biology of the stock, other environmental conditions, or management measures under an international agreement to which the U.S. participates, dictate otherwise.	This action is considering two alternatives for rebuilding T _{target} : Alt. 2 uses the ABC CR - projections estimate T _{target} of 5 years. Alt. 3 applies a constant F based on rebuilding in 7 years – projections estimate T _{target} of 7 years.
G	Generation time is the average length of time between when an individual is born and the birth of its offspring.	Age when herring successfully spawn based on Restrepo et al, 1998. Therefore, G = 6 years (See Appendix 2).
F _{rebuild}	Fishing mortality associated with achieving T _{target} .	Filled in after preferred alternative for rebuilding plan selected (Section 4.1 – Alt. 2 or Alt. 3).

4.2 ACTION 2 – ADJUST HERRING ACCOUNTABILITY MEASURES (AMs)

The Herring FMP has AMs in place to account for overages of the ACL and sub-ACLs, as well as underage or carryover measures. This action is considering three alternatives related overages: Alternative 1 (No Action) or no changes to the AMs in place to address overages, Alternative 2 would allow an overage of 10% of a sub-ACL if the total ACL is not exceeded, and Alternative 3 that would allow sub-ACL overages by any amount, so long as the total ACL is not exceeded. The Council also discussed whether alternatives should be developed to potentially adjust measures related to underage or carryover – currently up to 10% of unused sub-ACL can be carried over to a future fishing year, but the total ACL does not increase from carryover. However, the Council decided not to consider alternatives related to carryover at this time, see Section ??? for more details. Finally, Section ??? summarizes trends in ACL usage in the herring fishery including when and where sub-ACLs have been exceeded.

4.2.1 Overage AMs

4.2.1.1 Overage AM Alternative 1 – No Action

Under this alternative there would be no changes to the proactive, in-season or reactive AMs in place to minimize overages. During a fishing season NMFS monitors catch and when the fishery is estimated to catch 92% of a sub-ACL that entire herring management area closes to the herring fishery for the remainder of the fishing year (implementation of a 2,000 lb. possession limit). Note this measure was modified recently in Framework 8 for Areas 2 and 3 only. Now there is a two-step proactive AM in place intended to slow the fishery down as it approaches the sub-ACL in Areas 2 and 3 to improve access to the mackerel fishery before areas close to herring fishing. For Areas 2 and 3 only when 90% of the sub-ACL is estimated to be caught a 40,000 lb. possession limit is implemented, then when 98% of the sub-ACL for those areas is estimated to be caught the lower 2,000 lb. possession limit is implemented. The in-season AM for Areas 1A and 1B remain the same, at 92% of a sub-ACL a 2,000 lb. possession limit is implemented for those areas.

The Herring FMP also has a reactive pound for pound AM to address any overages. After final year end catch estimates are calculated, any overages of sub-ACLs and/or the total ACL are reduced in a subsequent year by the same amount of the overage. Section ??? summarizes when and where this has occurred in the herring fishery in the last decade or so.

Rationale: Both the proactive, in-season AMs that implement possession limits that close directed herring fishing in a management area for the remainder of the year, as well as the payback reactive AMs that reduce future allocations to account for overages are designed to keep the fishery below annual catch limits and help prevent overfishing. The in-season AM helps prevent this high-volume fishery from exceeding sub-ACLs, and if there are any overages the reactive AMs are a pound for pound reduction to prevent overfishing.

4.2.1.2 Overage AM Alternative 2 – Allowance for herring fishery overages up to 10% of sub-ACL if total ACL not exceeded

Under Alternative 2, catch from a management area that exceeds the sub-ACL by less than 10% of the sub-ACL is not deducted from the ACL and respective sub-ACL in a subsequent year unless total catch also exceeds the ACL. Catch from a management area that exceeds the sub-ACL by greater than 10% is deducted from the ACL and respective sub-ACL in a subsequent year, even if total catch does not exceed the ACL.

Rationale: This AM would allow catch to exceed 10% of the sub-ACL in a herring management area but limiting overages to 10% acknowledges there are spatially distinct stock/spawning components and limits additional fishing pressure allowed. This measure also helps prevent overfishing because the total ACL cannot be exceeded, if catch is 10% higher in one area, it needs to be lower by that amount or more in another area. This alternative is expected to provide more flexibility for the herring fishery and help minimize negative economic impacts of overage deductions while keeping catch under the ACL and ABC. Limiting overages to 10% is expected to limit fishing pressure on one sub-component of the overall resource and prevent overfishing one spatial component of the overall stock.

4.2.1.3 Overage AM Alternative 3 – Allowance for herring fishery overages of sub-ACLs until the total ACL is harvested

Under Alternative 3, catch from a management area that exceeds the sub-ACL would be deducted from the ACL and respective sub-ACL in a subsequent year, only if total catch also exceeded the ACL. Catch can exceed a sub-ACL by any amount so long as the total ACL is not exceeded.

Rationale: This alternative would place accountability at the ACL level, instead of the sub-ACL level. Having AMs trigger at the full ACL and not the sub-ACL is allowed and is consistent with National Standard guidelines. The fishery would not be permitted to exceed the total ACL so this measure is expected to help prevent overfishing; however, this alternative could allow higher fishing mortality on sub-components of the stock if sub-ACLs are exceeded. This alternative is expected to provide maximum flexibility by minimizing negative economic impacts of overage deductions while keeping catch under the ACL and ABC.

4.3 CONSIDERED BUT REJECTED ALTERNATIVES

4.3.1 Carryover AMs

Currently in the Herring FMP if a management area's sub-ACL is not fully harvested and total catch does not exceed the ACL, then the amount of the underage, up to 10% of the sub-ACL, is carried over and applied to the respective sub-ACL in a subsequent year. Carryover does not increase the ACL. This measure is automatic unless the Council recommends NMFS temporarily suspend this measure, or reduce the allowance from 10% to a lower value (i.e. in Framework 8 the Council recommended and NMFS approved that carryover be limited to 5% of unused sub-ACLs for FY2019 and 2020).

This measure allows the fishery access to unharvested catch but maintains the management uncertainty buffer between ABC and the ACL, while giving the fleet some flexibility in choosing where to harvest the ACL. In several cases the Council has temporarily suspended carryover (set it at 0%) or limited it to 5% in various specifications packages over the years.

Rationale for rejection: Currently the Council supports maintaining the status quo approach for carryover due to herring's overfished status and the variability in allocation and fishing effort across herring management areas. When biomass is low, suspending or minimizing the carryover of unharvested catch could help speed stock rebuilding. Furthermore, if measures shift allocation by area or season, there are risks of unintended consequences with potential distributional impacts on fishery participants.

5.0 AFFECTED ENVIRONMENT

5.1 INTRODUCTION

The Affected Environment is described in this action based on valued ecosystem components (VECs), including target species, non-target species, predator species, physical environment and Essential Fish Habitat (EFH), protected resources, and human communities. VECs represent the resources, areas and human communities that may be affected by the alternatives under consideration in this action. VECs are the focus since they are the “place” where the impacts of management actions occur.

5.2 TARGET SPECIES (ATLANTIC HERRING)

5.3 NON-TARGET SPECIES (BYCATCH)

5.4 PROTECTED SPECIES

5.5 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

5.5.1 Physical Environment

5.5.2 Essential Fish Habitat

5.6 HUMAN COMMUNITIES

6.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

The impacts of the alternatives under consideration are evaluated herein relative to the valued ecosystem components (VECs) described in the Affected Environment (Section) and to each other.

6.1 INTRODUCTION

This action evaluates the potential impacts using the criteria in Table 2.

Table 2. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline).

VEC	Resource Condition	Impact of Action		
		Positive (+)	Negative (-)	No Impact (0)
Target and Non-target Species	Overfished status defined by the MSA	Alternatives that would maintain or are projected to result in a stock status above an overfished condition*	Alternatives that would maintain or are projected to result in a stock status below an overfished condition*	Alternatives that do not impact stock / populations
ESA-listed Protected Species (endangered or threatened)	Populations at risk of extinction (endangered) or endangerment (threatened)	Alternatives that contain specific measures to ensure no interactions with protected species (e.g., no take)	Alternatives that result in interactions/take of listed resources, including actions that reduce interactions	Alternatives that do not impact ESA listed species
MMPA Protected Species (not also ESA listed)	Stock health may vary but populations remain impacted	Alternatives that will maintain takes below PBR and approaching the Zero Mortality Rate Goal	Alternatives that result in interactions with/take of marine mammal species that could result in takes above PBR	Alternatives that do not impact MMPA Protected Species
Physical Environment / Habitat / EFH	Many habitats degraded from historical effort (see condition of the resources table for details)	Alternatives that improve the quality or quantity of habitat	Alternatives that degrade the quality, quantity or increase disturbance of habitat	Alternatives that do not impact habitat quality
Human Communities (Socioeconomic)	Highly variable but generally stable in recent years (see condition of the resources table for details)	Alternatives that increase revenue and social well-being of fishermen and/or communities	Alternatives that decrease revenue and social well-being of fishermen and/or communities	Alternatives that do not impact revenue and social well-being of fishermen and/or communities
Impact Qualifiers				
A range of impact qualifiers is used to indicate any existing uncertainty	Negligible	To such a small degree to be indistinguishable from no impact		
	Slight (sl) as in slight positive or slight negative	To a lesser degree / minor		
	Moderately (M) positive or negative	To an average degree (i.e., more than “slight”, but not “high”)		
	High (H), as in high positive or high negative	To a substantial degree (not significant unless stated)		
	Significant (in the case of an EIS)	Affecting the resource condition to a great degree, see 40 CFR 1508.27.		
	Likely	Some degree of uncertainty associated with the impact		
*Actions that will substantially increase or decrease stock size, but do not change a stock status may have different impacts depending on the particular action and stock. Meaningful differences between alternatives may be illustrated by using another resource attribute aside from the MSA status, but this must be justified within the impact analysis.				

6.1.1 Approach to Impacts Analysis

6.2 IMPACTS ON TARGET SPECIES (ATLANTIC HERRING)

6.3 IMPACTS ON NON-TARGET SPECIES (BYCATCH)

6.4 IMPACTS ON PROTECTED SPECIES

6.5 IMPACTS ON PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

6.6 IMPACTS ON HUMAN COMMUNITIES

6.7 CUMULATIVE EFFECTS ANALYSIS

7.0 APPLICABLE LAWS/EXECUTIVE ORDERS

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9.0 REFERENCES